Distr.: General
14 July 1999

English
Original: Russian

THIRD UNITED NATIONS CONFERENCE ON THE EXPLORATION AND PEACEFUL USES OF OUTER SPACE

Vienna
19-30 July 1999

Abstract of the national paper of the Russian Federation

Main results of the recent space activity of the Russian Federation

Preparation of the draft Russian Federation space programme for the period up to 2005 has now been completed.

The orbital network of spacecraft operated by Russia is carrying out assignments in a range of basic areas. The configuration of the current orbital network reflects its orientation towards providing solutions to major problems in the socio-economic realm and maximizing the economic impact obtained.

Satellite communications and television transmission constitute the most highly developed area of space services. The orbital network of the space communications, television transmission and navigation system comprises the Gorizont (communications and television), Ekran-M (television) and Nadezhda (navigation and rescue) spacecraft and the GLONASS system. In addition to the fixed-link system, mobile satellite communications systems are also being actively developed. Work is under way with a view to ensuring the operation of a personal communications system based on the Gonets system of low-Earth-orbit satellites. It is planned in the imminent future to make the transition to the new generation of satellites.

Assignments related to natural-resource and environmental monitoring are being performed by Meteor-3, Elektro, Resurs-01, Okean-01 and Resurs-F satellites. Photographic observation of the Earth's surface is also being carried out from the Mir manned orbital station.

Remote Earth sensing satellites are being used for a wide range of socio-economic and scientific research assignments. Spacecraft are currently in operation for the purposes of hydrometeorological (Meteor and Elektro), operational (Resurs and Okean) and photographic (Resurs-F) observation.

In order to achieve the most comprehensive approach possible to environmental monitoring tasks, it is planned to establish and expand, in a phased manner, the range of space facilities in operation within a future-oriented remote Earth sensing system.

Studies in the sphere of space technology and weightlessness physics have been directed towards the production under microgravity conditions of new organic and inorganic materials and the refinement of the technologies and equipment required for their production.

The main purpose of establishing a future-oriented space assembly is to complete the development of basic technologies for producing test parts for semi-conductors, "gradans" and other articles with practical industrial applications.

Under our space research programmes, attention is devoted in particular to the use of space technology in conducting more detailed study of high-energy space particles and of solar-terrestrial interaction, with a view to the development of a heliogeophysical monitoring system. Complex research of the Earth's magnetosphere is being continued, in addition to study of the interaction of processes on the Sun and in the circumterrestrial plasma with life on Earth.

During the 10 years of operation of the Granat orbital observatory, a detailed study has been made of several dozen galactic and extra-galactic sources, representing possible black

holes, neutron stars, X-ray novae and accumulations of galaxies and quasars. For the first time, sources emitting radiation in the annihilation gamma line of positronium have been localized.

Work is continuing in connection with the programme of research on the Earth's magnetosphere and ionosphere and of solar research under the international Coronas-I project (research on dynamic, active solar processes and the properties of solar cosmic radiation and electromagnetic solar radiation in the radio, visible, ultraviolet, X-ray and gamma bandwidths), as well as in connection with the international Advanced Photovoltaic and Electronic Experiments (APEX) project to study the effects of the artificially generated modulated electron fluxes and plasma beams on the Earth's ionosphere and magnetosphere.

Under the Prognoz-M2 (Interball) programme a system has been set up in space for conducting long-term fundamental research on processes taking place under the influence of solar radiation in the geomagnetic tail of the Earth's magnetosphere.

In addition to fundamental research, particular emphasis is laid on applied research projects for the forecasting of powerful magnetic storms giving rise to hazardous phenomena (induced currents) in power systems, power supply lines and data transmission networks.

Russia has amassed vast scientific and technical experience in connection with its manned space flight programmes. In the course of more than 13 years of operation of the Mir space station, a programme of research and experiments covering a broad spectrum of subject fields has been conducted.

An important factor in the development and strengthening of international space cooperation has been the Russian-American Mir-Shuttle and Mir-NASA joint programmes. Constituting phase 1 of the International Space Station (ISS) programme, they have allowed the partners to acquire invaluable experience in the conduct of joint long-duration flights.

A wide-ranging research programme has been carried out in recent years on board the Mir station by astronauts from the European Space Agency (ESA), Germany and France during long-duration flights under the Euromir and Pegasus programmes and also in the course of the expedition conducted under the Juno programme, etc.

The deployment of the ISS in orbit began with the launch in November 1998 of the first module Zarya. In December that year, the Unity module was connected to it. The ISS is scheduled to start operating as a permanently manned station as early as 2000.

In connection with the ISS project, the organization of the pure and applied research programme in the main traditional areas has acquired primary importance in new fields involving the use of orbital manned stations. Intensive work is being carried out in this regard by Russian and foreign scientists. Under the auspices of the Russian Space Agency (RKA) Science and Technology Coordination Council, a preliminary expert examination is being conducted and proposals are being selected for a programme of pure and applied research on board the Russian segment of the ISS.

The launch by Russian carrier rockets of foreign payloads (spacecraft) is an important and rapidly developing area of Russia's space activity. Russian and foreign partners have now established a number of joint ventures.

The system of rocket and space technology certification employed in Russia is the only such system of its kind and has provided the basis for achieving a high standard of reliability, safety and competitiveness of launch facilities on the world space market.

One of the most outstanding achievements in the realm of international cooperation has been the completion of the construction of a unique marine cosmodrome under the international project known as Sea Launch, involving the participation on the Russian side of the Energiya corporation.

An important socio-economic aspect of space activity is the deployment in the economic sphere and active industrial application of the latest scientific and technical advances. Work is currently under way to set up a system to ensure the intensive exploitation in different sectors of the economy of the potential offered by scientific and technical advances in the area of rocket and space technology. The necessary legislative and legal bases are now being established for the effective development of such a system.

Prospects and priorities for the development of the space activity of the Russian Federation at the beginning of the twenty-first century

With a view to the accelerated development of communications and television transmission infrastructure, it is planned to continue operating the existing Gorizont, Ekspress, Ekran-M and Gals space assemblies, while also developing new ones (Ekspress-K, Gals-R, Triada, Yamal, Gonets, etc.).

In the sphere of cartography and the investigation of natural resources, it is proposed to operate the photographic assemblies Resurs-F1M and Resurs-F2. There are plans to establish in the near future a more complete Resurs-DK space complex.

For the purposes of assignments in the areas of hydrometeorology and monitoring of the ozone layer, as well as radiation monitoring in circumterrestrial space, it is proposed to complete the establishment of a two-tier meteorological observation system from on board medium-Earth-orbit Meteor satellites and geostationary Electro satellites.

Research on gravitational and physical vacuum properties in the future will be performed in connection with the Newton project. It is planned to carry out gravitational experiments involving radio signals in regions extremely close to the Sun, as well as experiments to investigate the effects of gravitation on physical vacuum parameters and to study gravitational properties with the aid of test bodies.

Astrophysical research is to be carried out through the establishment of the Prognoz-M2 and Spektr space assemblies (RG, R and UF). Fundamental research in this field will, in particular, provide solutions to current scientific and technological problems in the field of power engineering.

The programme of research on solar-terrestrial interaction and on processes in circumterrestrial space and the physics of the ionosphere and biosphere is being carried out under the Interball and Rezonans Projects and in connection with heliophysical investigations through the launch of a space object into extended heliocentric orbit and through the Solar Probe and other projects.

With regard to investigations of planets and celestial bodies within the solar system, it is planned to carry out the Fobos-Grunt Project to study Mars and its satellites. Russian participation in the international Mars research programme is also envisaged.

Biomedical research will, as in the past, be directed towards the provision of scientific and methodological support for long-duration manned space flights and will be conducted with the aid of unmanned space assemblies and in the course of manned station flights.

The manned flight programme will be directed towards the coordination of wide-ranging assignments under the respective programmes operated by Russia, the United States of America, Japan, Canada and ESA.

In the area of space technology it is planned, in the near future, to develop fundamental and experimental research in the area of weightlessness physics and to develop basic technologies for producing unique materials and biological preparations with properties unobtainable on Earth.

After the year 2000 it is proposed, in the area of space materials research, to explore the possibility of moving from single-use spacecraft (Foton-type spacecraft) to reusable unmanned spacecraft.

The development of space facilities for navigational purposes is being conducted with a view to the provision of a global high-precision navigation service supporting an unlimited number of users. Under the GLONASS development programme, it is planned to establish integrated use of its radionavigational field and that of the United States GPS system (NAVSTAR).